

Chapter 7

Summary

The Aviation Capacity Enhancement Plan is intended to be a comprehensive “ground-up” view of aviation system requirements and development, starting at the airport level and extending to terminal airspace, en route airspace, and airspace and traffic flow management. The first step in this problem-solving exercise is problem definition.

This plan defines the capacity problem in terms of flight delays, rather than dealing with a more abstract “definition of capacity.” While it is relatively simple to compute an airport’s hourly throughput capacity (the number of flight operations which can be handled under IFR or VFR for a given runway operating configuration), that throughput can change each hour as weather, aircraft fleet mix, and runway configurations change. Annualizing airport capacity is thus a difficult task.

In 1993, 23 of the top 100 airports each exceeded 20,000 hours of airline flight delays. If no improvements in capacity are made, the number of airports which could exceed 20,000 hours of annual aircraft delay in the year 2003 is projected to grow from 23 to 32.

While it is common for demand to exceed hourly capacity at some airports, there are ways of accommodating that demand. For example, air traffic management can regulate departures and slow down en route traffic, so flights are shifted into times of less congestion. However, this is only a temporary solution, because, as traffic increases at a given airport, there will be fewer off-peak hours into which flights might be shifted.

There are several techniques under investigation to manage demand at delay-problem airports. One is to improve the reliever and general aviation (GA) airport system so that small aircraft prefer to use them. There could be significant reduction in flight delays if a percentage of small/slow aircraft operations shifted to reliever airports. However, some of the forecast delay-problem airports have a low percentage of small aircraft operations. Those airports are largely “relieved,” and a further reduction in the operations of small/slow aircraft would be of marginal significance in the reduction of flight delays.

Having first identified forecast delay-problem airports, this plan next attempts to document planned or technologically feasible capacity development at those airports. The FAA co-sponsors airport capacity design team studies at major airports to

assess how airport development and new technology could “optimize” capacity on a site-specific basis. Airport capacity design team studies have been completed at Albuquerque, Atlanta, Boston, Charlotte, Chicago, Cleveland, Columbus, Detroit, Fort Lauderdale-Hollywood, Honolulu, Houston Intercontinental, Indianapolis, Kansas City, Los Angeles, Memphis, Miami, Minneapolis-Saint Paul, Nashville, New Orleans, Newport News/Williamsburg, Norfolk, Oakland, Orlando, Philadelphia, Phoenix, Pittsburgh, Raleigh-Durham, Richmond, St. Louis, Salt Lake City, San Antonio, San Francisco, San Jose, San Juan, Seattle-Tacoma, and Washington Dulles.

Moving from “the ground up,” this plan identifies new terminal airspace procedures which will increase capacity for existing or new runway configurations. Of the top 100 airports, 9 could benefit from independent parallel approaches using the Final Monitor Aid (FMA) with current radar systems, 4 could benefit from independent parallel approaches to triple and quadruple runways using current radar systems, 13 could benefit from simultaneous operations on wet intersecting runways, 45 could benefit from improved operations on parallel runways separated by less than 2,500 feet, 9 could benefit from dependent approaches to three parallel runways, and 38 could benefit from independent converging approaches. Demonstration programs have been completed or are underway for these new approach procedures.

Some of the new approach procedures and airport capacity projects require new technology and new systems and equipment. This plan outlines the progress of FAA RE&D and F&E programs currently under way to provide that new technology.

Many of the technology programs are designed to reduce the capacity differential between IFR and VFR operations. Delays attributable to weather (resulting in large part from the difference in VFR and IFR separation standards) accounted for 72 percent of all flights delayed 15 minutes or more in 1993. Significant gains in capacity may be achieved with the use of new electronic guidance and control equipment if two or three flight arrival streams can be maintained in IFR, rather than being reduced to one or two arrival streams. These programs are the Precision Runway Monitor (PRM), Converging Runway Display Aid (CRDA), Triple and Quadruple Instrument Approaches, and Global Positioning System (GPS).

Some of the new technology programs are designed to provide more information to air traffic controllers, such as the Center-TRACON Automation System (CTAS), or to pilots, such as the Traffic Alert Collision and Avoidance System (TCAS), with improved visual displays and non-voice communications.

Those programs may not show as large an increase in capacity as those programs providing multiple flight arrival and departure streams, but they are significant nonetheless.

Some of the technology programs are designed to improve the efficiency of aircraft movement on the airport surface. The Airport Surface Traffic Automation (ASTA) program, for example, will expedite surface movement while reducing the number of runway incursions.

Some of the technology programs are computer simulation tools to help in airfield and airspace analysis. For example, the Airport and Airspace Simulation Model (SIMMOD), National Airspace Performance Analysis Capability (NASPAC), Sector Design Analysis Tool (SDAT), and Terminal Airspace Visualization Tool (TAVT) will help in the evaluation of various alternatives. Some technology programs are designed to “optimize” the aviation system through better planning and improved prediction capability in a laboratory environment such as the National Simulation Capability (NSC).

The “ground up” view encompasses en route airspace. This plan outlines programs designed to increase en route airspace capacity, including Automated En Route Air Traffic Control (AERA), Advanced Traffic Management System (ATMS), Automatic Dependent Surveillance (ADS), and Oceanic Display and Planning System (ODAPS).

Airspace capacity design team projects have been established to analyze and optimize airspace procedures. Projects have been accomplished in Los Angeles, Dallas-Ft. Worth, Chicago, Kansas City, Houston/Austin, Oakland, New York, Jacksonville, Miami, and Atlanta. Results summaries are included in this plan.

From a “ground up” view, after optimizing existing airport capacity, terminal airspace procedures, and en route airspace capacity using new technology, the next level is adding “reliever” airports and “supplemental” airports for additional aviation system capacity. “Supplemental” airports are existing commercial service airports that could act as reliever airports for delay-problem airports. The FAA is also pursuing initiatives for the joint civilian and military use of current military airfields and the conversion of former military air bases to civilian use for capacity enhancement to the overall aviation system.

The largest capacity gains come from building new airports and new or extended runways at existing airports. One such project is the construction of a new international airport at Denver. Construction began in late 1989. The initial phase will consist of five runways, and is scheduled to open in 1995. In 1992, Colorado Springs completed construction of a new par-

allel runway, and Nashville and Washington Dulles completed runway extensions. In 1993, Detroit Metropolitan Wayne County completed construction of a new parallel runway, and runway extensions were completed at Dallas-Fort Worth, San Jose, Kailua-Kono Keahole, and Islip Long Island Mac Arthur. In 1993, Salt Lake City and Memphis began construction of independent parallel runways, and Louisville Standiford Field began construction of two independent parallel runways. In 1994, Kansas City should complete construction of a new independent parallel runway.

Of the top 100 airports, 60 have proposed new runways or extensions to existing runways. Of the 23 delay-problem airports in 1993, 15 are in the process of constructing or planning the construction of new runways or extensions to existing runways. Of the 32 delay-problem airports forecast for the year 2003, 24 propose to build new runways or runway extensions. The total anticipated cost of completing these new runways and runway extensions exceeds \$9.0 billion.

While much has been done and more is planned to increase system-wide capacity, it should be noted that the FAA's resources are limited. The demand for Facilities and Equipment (F&E) and Airport Improvement Program (AIP) funds far exceeds availability. However, the FAA will continue to explore innovative methods of increasing system capacity.

System capacity must continue to grow in order to enable the air transportation industry to maintain the same level of service quality and allow airline competition to continue. In the dozen years since airline deregulation, real air fares have declined. Both the quality and cost of air service are strongly tied to aviation system capacity and will continue to show favorable trends only if aviation system capacity continues to grow to meet demand.